

# Prevalence and Family Determinants of Geriatric Depression Among Elderly People in Elderly Support Groups in Rwanda

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**Background:** The 1994 Tutsi genocide in Rwanda significantly impacted family structure, with many people growing old alone and lacking social bonds and connections with family members. However, little is known about the contribution of the family environment to geriatric depression which was highlighted by WHO as a psychological problem with a 10% to 20% prevalence rate among the elderly worldwide. This study aims to investigate geriatric depression and associated family determinants among the elderly in Rwanda.

**Methods:** With a community-based cross-sectional study design, we assessed geriatric depression (GD), quality-of-life enjoyment and satisfaction (QLES), family support (FS), loneliness, neglect, and attitude toward grief in a convenience sample of 107 participants ( $M=72.32$ ,  $SD=8.79$ ) aged between 60 and 95 years who were recruited from three groups of elderly people supported by the NSINDAGIZA organization in Rwanda. SPSS (version 24) was used for statistical data analysis; differences across various socio-demographic variables were tested for significance by an independent *t*-test; the relationship between study variables was tested by Pearson correlation analysis; and multiple regression analysis was performed to model the contribution of independent variables to dependent variables.

**Results:** A total of 64.5% of the elderly scored above the threshold of the normal range of geriatric depression ( $SDS>49$ ), with higher symptoms in women than in men. Multiple regression analysis indicated that family support and quality-of-life enjoyment and satisfaction were contributors to geriatric depression in the participants.

**Conclusion:** Geriatric depression was relatively common in our participants. It is associated with the quality of life and family support received. Hence, adequate family-based interventions are needed to improve the well-being of geriatric people in their respective families.

**Keywords:** depression, family environment, elderly, Rwanda

## Introduction

According to the United Nations, senescence or old age in humans is considered to be 60 or 65 years of age or older.<sup>1</sup> The elderly population has grown quickly in recent decades as mortality and fertility rates have decreased and the quality of life has improved.<sup>2</sup> The number of persons aged 60 or more was one billion in 2019, and it is predicted to rise to 1.4 billion by 2030 and 2.1 billion by 2050, with low- and middle-income nations accounting for 80% of all older people by 2050.<sup>3,4</sup> Senescence is a natural process characterized by the degradation of human body systems and cells, resulting in death.<sup>5</sup> It causes significant changes in different domains of individuals, such as physiological (structural and functional losses), sociological (the decline and losses in the values that society bestows on individuals), and psychological (the deterioration of problem-solving abilities, perception, and learning).<sup>6</sup>

More than 20% of adults over 60 years old are more likely to experience mental health issues.<sup>7</sup> Geriatric depression is one of the major mental health issues among the elderly<sup>8</sup> and a risk factor for mortality and disability.<sup>9</sup> Scholars have revealed that geriatric depression remains undiagnosed in about 50% of the affected population and differs greatly.<sup>10,11</sup> It is also well known that geriatric depression is caused by a complex combination of social, psychological, and biological factors.<sup>12,13</sup>

According to WHO global estimates, elderly people ranging from 10 to 20% have significant symptoms of geriatric depression.<sup>14–16</sup> Recent evidence from a systematic review and meta-analysis study showed that the prevalence of geriatric depression among elderly people was 31.74%, with a higher rate in developing countries (40.78%) than in developed countries (17.05%).<sup>17</sup> Contributing factors for geriatric depression in developing countries are a history of chronic disease, poor social support, older age, marital loss<sup>18</sup> poor quality of life, low monthly income, having low educational status, a family history of mental illness, and cognitive impairments,<sup>19</sup> but the female population is more likely to suffer than the male population.<sup>18</sup> Despite the previous findings, the burden of geriatric depression is not properly addressed due to the insufficient data that directly affects mental health care delivery in different communities all over the world.<sup>15,20</sup>

## Rationale

The 1994 Tutsi genocide in Rwanda significantly impacted family structure, with many people growing old alone. There are presently elderly people with various mental health challenges, including trauma, the stigma associated with older age, abuse, neglect, a low public profile, and a lack of basic needs.<sup>21</sup> Although depression was revealed as a seriously disabling mental health issue in post-genocide Rwanda,<sup>22–26</sup> social bonds and connections with family members were proven to be protective factors against geriatric depression.<sup>27–29</sup> On the other hand, a lack of family bonds and family dysfunction were reported as potential risk factors for geriatric depression.<sup>30,31</sup> Considering a need to investigate burden-related family attitudes and behaviours that hinder elderly people's ability to recover from geriatric depression,<sup>32</sup> family determinants of geriatric depression should be explored in sub-Saharan African countries like Rwanda, where the family was negatively affected by the consequences of the genocide against the Tutsi in 1994<sup>33</sup> to inform policymakers, practitioners, and future researchers.

With regard to what is known, the majority of trending studies on geriatric depression have focused on improved diagnostic tools,<sup>34–37</sup> prevalence,<sup>38–41</sup> comprehension of differences in demographic traits (eg, occupation status, gender, age, marital status, health status, and social support),<sup>42</sup> and the plausible risk factors.<sup>43–45</sup> Consistently, researchers have found that geriatric depression can be influenced by various family factors such as family support,<sup>46</sup> quality of life enjoyment and satisfaction,<sup>47</sup> loneliness,<sup>48</sup> neglect,<sup>49</sup> and grief.<sup>50</sup> Our study intends to explore the influence of the family environment on geriatric depression symptoms in the Rwandan context.

The rated family-based factors of geriatric depression symptoms are family support, quality of life enjoyment and satisfaction, loneliness, neglect, and grief whilst personal characteristics are age, education, gender, and marital status. Therefore, we hypothesize that (i) there is a high rate of geriatric depression in the study sample; (ii) there is a significant difference in geriatric depression symptoms among participants with different personal characteristics; and (iii) there is an association between geriatric depression and family support, quality of life enjoyment and satisfaction, loneliness, neglect, and grief.

## Methods

### Study Design, Sample, and Procedures

This study was approved by the Institutional Review Board of the University of Rwanda, CMHS (IRB-CMHS). It adopted a quantitative approach with a community-based cross-sectional study design. A convenience sample of 107 elderly people (20 males and 87 females) was selected from three available groups of elderly people supported by NSINDAGIZA (a Rwandan organization that promotes the rights and welfare of the elderly, especially the most vulnerable older women and men in the country) in Rwanda's Nyarugenge and Huye Districts. The total number of participants from the three groups was 218 (51 males and 167 females) aged 60 or older, but those eligible were 107.

Before selecting the participants, approval was obtained from the director of NSINDAGIZA, who also supported the selection process. Inclusion criteria were to be a Rwandan with permanent residence, supported by NSINDAGIZA organization, aged 60 or older, and ready to participate voluntarily in the study. Participants were excluded from the study if they were unable to communicate, were psychologically distressed by research questionnaires, or were psychologically unstable due to chronic diseases or psychotropic medication.

Before collecting data, participants were informed of the research objectives and ethical guidelines. They, therefore, provided oral informed and accepted consent or written informed consent for their voluntary participation. A trained psychologist was ready to provide appropriate emotional support to the participants who were psychologically distressed by the questionnaires. These participants were then referred to the nearest clinic for further support. Similarly, a trained research assistant collected data from those who were unable to write. Besides, the participants were informed of their right to opt out of the study at any point and that there were no penalties or other impacts for their choice. The study questionnaires were granted for non-commercial use. To ensure the content validity of the Kinyarwanda version, those questionnaires were translated from English to Kinyarwanda and back-translated from Kinyarwanda to English by three psychologists with fluent competence in Kinyarwanda and English. The similarity between the two English versions helped to ensure the content validity of the questionnaires. Furthermore, the reliabilities of the questionnaires were assessed using Cronbach's alpha coefficients. The alpha values were above 0.7, except the SDS, MNBS, and AAG values ranged between 0.56 and 0.69. Fortunately, these alpha values are between 0.5–0.7, indicating an acceptable level of moderate reliability for those questionnaires.<sup>51</sup> Additionally, no missing data were detected in our dataset.

## Measurements

The Self-Rating Depression Scale (SDS) consists of 20 items to screen for geriatric depression symptoms “over the past several days” on a 4-point Likert-type scale ranging from 1 (little or none of the time) to 4 (most or all of the time).<sup>52</sup> The plausible scores range from 20 through 80, where the score classifications are as follows: normal (<50), mild depression (50–59), moderate to marked major depression (60–69), and severe to extreme major depression (>70).<sup>52</sup> In this study, the Cronbach's alpha coefficient was 0.67.

The Quality of Life Enjoyment and Satisfaction Questionnaire-Short Form (Q-LES-QSF), with 16 items, evaluates life satisfaction over the past week.<sup>53</sup> This self-administered questionnaire originating from the general activities scale of 93 items,<sup>54</sup> assesses overall enjoyment and satisfaction in different life domains such as daily functioning, economic status, household and leisure activities, medications, mood, work, physical health, sexual life, social and family relationships, and overall well-being. Each item is rated on a 5-point scale from 1 (Very Poor) to 5 (Very Good). Then, scores from the individual items are added together to provide a possible score ranging between 14 and 70, where a higher score indicates better enjoyment and satisfaction with life.<sup>53</sup> The first 14 items are summed together to give the total score for further analysis, while the final two (medications and overall life satisfaction) are given separate consideration.<sup>53</sup> The Cronbach's Alpha value was 0.85 in the current sample.

The University of California, Los Angeles Loneliness Scale (UCLA Loneliness Scale) was developed by Russell in 1980 to measure loneliness caused by a discrepancy between the desire for social connection and the actual level of loneliness.<sup>55</sup> It is a one-dimensional scale consisting of 20 items, of which 11 are positive and 9 are negative. The respondent is required to rate each item on a four-Likert rating scale, with 4 for “all the time”, 3 for “sometimes”, 2 for “rarely”, and 1 for “never”.<sup>55</sup> The overall score runs from 20 to 80, with higher levels denoting more severe symptoms of loneliness.<sup>55</sup> The Cronbach's Alpha coefficient was 0.81 in the current sample.

The family support scale (FSS) for elderly people comprises 20 items to assess perceived support for the following 20 areas: company, daily activities, emotional support, food, happiness, health, help in problem-solving, important decisions, important people, information, love, money, personal needs, personal problems, religious activities, respect, satisfaction, sleep, social events, and treatment.<sup>56</sup> Each item is measured on a 4-point Likert scale from 0 (no) to 3 (much).<sup>56</sup> The total possible scores fall between 0 and 60, where a higher score reflects greater perceived family support for the elderly.<sup>56</sup> In the current sample, the Cronbach's alpha was 0.94.

The Multidimensional Neglectful Behaviour Scale (MNBS) aims to assess how often four fundamental developmental needs, like physical (clothing, food, medical care, and shelter), emotional (companionship, support, and

affection), supervisory (setting limits), and cognitive (explaining things) were neglected for older people when they were growing up.<sup>57</sup> It is composed of 8 items assessed on a four-Likert rating scale, from “Strongly Disagree” (1) to “Strongly Agree” (4), where greater experienced neglect is reflected in higher scores.<sup>57</sup> Cronbach’s alpha for the current sample was 0.56.

The Adult Attitude to Grief (AAG) scale assesses the level of vulnerability in grief.<sup>58</sup> It comprises 9 items with five response options, ranging from 4 for strongly agree to 0 for strongly disagree.<sup>58</sup> All items are summed to get the total score, where a score greater than 24 indicates severe vulnerability to grief, one ranging between 21 and 23 indicates higher vulnerability, and a score below 20 indicates lower vulnerability to grief.<sup>58</sup> In the current sample, Cronbach’s alpha was 0.69.

## Statistical Analysis

Data analysis was carried out in line with the study hypotheses and objectives, using IBM SPSS version 24. In the first step, descriptive statistics were performed to verify the reliability of the standardized scales, means, and standard deviations of the study variables and further determine the frequencies of sociodemographic variables and clinical symptoms of geriatric depression based on cut-off scores. In the second step, skewness and kurtosis were used to determine whether the study variables were normally distributed. However, non-normally distributed samples were identified because the kurtosis was greater than 2 for dependent variable. This means that the estimation of values for parametric tests was not possible with our data.<sup>59</sup> Fortunately, there are estimation techniques other than normal theory, such as bootstrapping, an alluring estimation technique that requires few assumptions and deals with non-normally distributed data.<sup>60–63</sup> Hence, a bootstrapped independent *t*-test, correlation, and multiple linear regressions with 5000 bootstrap samples were used to make the right decision on the use of predicting analysis for determinants of geriatric depression. It helped to calculate statistical significance using 95% confidence intervals. In this case, when the 95% confidence interval does not include 0, this indicates that there is statistically significant result.

## Results

### Characteristics of the Study Participants

As presented in Table 1, the study sample was composed of 107 elderly people (M=72.32, SD=8.79) aged between 60 and 95 years, predominantly more females (81.3%) than males (18.7%). Over half of the sample (67.3%) did not have

**Table 1** Analysis of Socio-Demographic Characteristics of the Participants

<b>Age</b>		
Mean		72.32
Std. Deviation		8.79
Minimum		60
Maximum		95
<b>Gender</b>	<b>n</b>	<b>%</b>
M	20	18.7
F	87	81.3
Total	107	100
<b>Marital status</b>	<b>n</b>	<b>%</b>
Have a partner	35	32.7
Do not have a partner	72	67.3
Total	107	100
<b>Education</b>	<b>n</b>	<b>%</b>
Attend school	62	57.9
Did not attend school	45	42.1
Total	107	100

any partner, while a small part of the sample (32.7%) was revealed to be in partnership. About 57.9% of the participants attended formal school, allowing them to be able to read and write. However, 42.1% of them cannot write or read because of not attending formal school.

## Descriptive Analysis of Study Variables

Geriatric depression (GD), family support (FS), quality of life enjoyment and satisfaction (QLESQ), loneliness, neglect, and grief underwent skewness and kurtosis screening to assess the normality of the scale's distribution. Following an argument by George and Mallery stating that skewness and kurtosis values should range between  $-2$  and  $+2$ ,<sup>64</sup> study findings showed that all variables were in the normal range except geriatric depression, which violated the kurtosis requirements (Table 2). Consequently, using the bootstrapping technique was a suitable solution for further analysis.<sup>60–63</sup>

## Rate of Geriatric Depression Among the Participants

Table 3 provides estimates of the prevalence of participants' geriatric depression based on various cut-off values for the Self-Rating Depression Scale (SDS) total scores. Overall, 64.5% of the participants had significant symptoms of geriatric depression. Table 3 shows that only 35.5% of the participants were in the normal range, 52.3% had mild symptoms, and 12.2% had moderate symptoms. However, no cases of severe depression were highlighted by the analysis.

However, identified geriatric symptoms are not equally distributed across different sociodemographic variables. Results from an independent *t*-test show that there were no statistically significant differences in geriatric depression symptoms between the participants who have partners and those who do not have partners ( $t(156) = 0.025$ ,  $p = 0.91$ ), or between participants who attended school and those who did not attend school ( $t(156) = -1.33$ ,  $p = 0.19$ ), but there were statistically significant differences in geriatric depression symptoms between females and males ( $t(105) = -3.05$ ,  $p = 0.007$ ), with more symptoms in the female group ( $M=51.5$ ;  $SD=8.15$ ) than in the male group ( $M=45.9$ ;  $SD=7.27$ ). Results from the independent *t*-test are presented in Table 4.

## Bivariate Correlation Analyses

Results from bivariate correlation analyses are presented in Table 5. Given that some of the variables are not normally distributed, the bootstrapped confidence intervals were more concerning than the significance of Pearson correlations, because the distribution of scores cannot alter the bootstrapped confidence intervals, but it might have an impact on the significance value.<sup>65</sup> The lower and upper boundary values are included in these confidence intervals, which are referred to as BCa 95% Confidence Intervals (CI).

**Table 2** Descriptive Analysis of Study Variables

	Geriatric Depression	Family Support	QLESQ	Loneliness	Neglect	Grief
Mean	50.46	34.24	41.15	41.31	15.81	10.99
Std. Deviation	8.26	14.73	8.40	10.05	4.18	5.33
Skewness	-1.82	-0.51	-0.09	-0.49	0.02	-0.11
Kurtosis	9.46	-0.28	0.79	1.11	-0.66	0.26

**Table 3** Distribution of Symptoms of Geriatric Depression Among the Participants

Level of Symptoms of Geriatric Depression	Frequency	%
Normal range (25–49)	38	35.5
Mildly depressed (50–59)	56	52.3
Moderately depressed (60–69)	13	12.2
<b>Total</b>	<b>107</b>	<b>100.0</b>

**Table 4** Results from Independent Samples Test

				Levene's Test for Equality of Variances		Bootstrap <sup>a</sup>		BCa 95% Confidence Interval	
	N	Mean	SD	F	Sig.	t	Sig.	Lower	Upper
Males	20	45.9	7.27	0.04	0.84	-3.05	0.007	-9.22	-2.11
Females	87	51.5	8.15						
Have a partner	35	50.34	7.02	0.27	0.60	-0.11	0.91	-3.14	2.84
Do not have a partner	72	50.51	8.85						
Attend school	62	49.6	8.95	0.09	0.75	-1.33	0.19	-5.06	0.88
Did not attend school	45	51.64	7.13						

**Note:** <sup>a</sup>Unless otherwise noted, bootstrap results are based on 5000 bootstrap samples.

**Table 5** Correlation Between GD, FS, QLESQ, LNSS, NGLCT, and Grief (N=107): Bootstrap<sup>c</sup>

			GD	FS	QLESQ	LNSS	NGLCT	Grief
1	BCa 95% CI	Lower		-0.438	-0.475	-0.157	-0.104	-0.409
		Upper		-0.105	-0.096	0.263	0.204	0.168
2	BCa 95% CI	Lower			0.171	-0.558	-0.489	-0.225
		Upper			0.546	-0.190	-0.195	0.133
3	BCa 95% CI	Lower				-0.284	-0.273	-0.314
		Upper				0.054	0.098	0.028
4	BCa 95% CI	Lower					0.089	0.013
		Upper					0.474	0.345
5	BCa 95% CI	Lower						0.058
		Upper						0.342
6	BCa 95% CI	Lower						
		Upper						

**Notes:** <sup>c</sup>Unless otherwise noted, bootstrap results are based on 5000 bootstrap samples. There are significant correlations where the 95% confidence interval does not include 0.

**Abbreviations:** GD, Geriatric Depression; FS, Family Support; QLESQ, Quality of Life Enjoyment and Satisfaction; LNSS, Loneliness; NGLCT, Neglect; Grief, Grief.

For our five correlation coefficients, GD is negatively correlated with FS (BCa 95% CI: -0.43, -0.10) and QLESQ (BCa 95% CI: -0.47, -0.09), but it is not correlated with loneliness (BCa 95% CI: -0.15, 0.26), neglect (BCa 95% CI: -0.10, 0.20), and grief (BCa 95% CI: -0.40, 0.16). These results support a plausible association between the dependent variable, geriatric depression (GD), and the independent variables, FS and QLESQ.

### Significant Family Determinants of Geriatric Depression Among the Participants

Our dependent variable (GD), as mentioned in the descriptive analysis section, is significantly kurtotic, making bootstrapping an attractive and viable estimation technique since it does not require normally distributed data. It was shown in Table 6 that both independent variables, namely FS ( $b = -0.10, p < 0.05$ , BCa95% CI: -0.186 and -0.020) and QLESQ ( $b = -0.19, p < 0.05$ , BCa95% CI: -0.364 and -0.022) were found to be statistically significant contributors to geriatric depression in the participants. It was also noted that the variables' 95% lower- and upper-bound confidence intervals were negative in value, indicating a statistically significant effect. These findings revealed that a lower level of FS and QLESQ among the participants predicted the symptoms of geriatric depression.

**Table 6** Results from Multiple Regressions Analysis: Bootstrap<sup>a</sup>

					BCa 95% Confidence Interval		
Model		B	Bias	Std. Error	Sig. (2-tailed)	Lower	Upper
I	(Constant)	61.938	-0.014	4.108	0.000	54.159	69.902
	FS	-0.100	-0.001	0.042	0.029	-0.186	-0.020
	QLESQ	-0.195	0.001	0.086	0.035	-0.364	-0.022

**Notes:** <sup>a</sup>Unless otherwise noted, bootstrap results are based on 5000 bootstrap samples. There are significant predictors where the 95% confidence interval does not include 0.

## Discussion

The results of this study showed that 64.5% of the participants are identified as meeting the criteria for geriatric depression. This rate is higher than the one recently observed in developing countries (40.78%) and developed countries (17.05%).<sup>17</sup> This difference can be explained by the fact that low-income countries are immoderately affected by mental disorders,<sup>66</sup> with depression as a major cause of disease burden, especially in older people.<sup>67</sup>

Additionally, results indicate that female participants are more vulnerable to geriatric depression than men. This finding is consistent with previous cross-sectional studies.<sup>68,69</sup> Consistently, theories hold that women are more likely than men to develop more symptoms of depression due to the effect of the menstrual cycle and time surrounding menopause,<sup>70</sup> the socialization effect that requires girls to be more caring while boys are required to be more independent,<sup>71,72</sup> society's undervaluation of women's roles and responsibilities,<sup>73</sup> the use of ruminative coping style which leads to the development of depressive symptoms,<sup>74</sup> and stressful life events encountered by more women than men.<sup>7,75</sup> In addition, women are more likely than males to develop internalizing disorders (such as depression and anxiety), but men are more likely to exhibit externalizing problems (ie, violence, substance abuse).<sup>76-79</sup>

Further, geriatric depression was negatively associated with family support. This means that a decrease in perceived social support may be linked to an increase in geriatric depression. A recent integrative literature review conducted by Vilas showed that the lack of family support is associated with geriatric depression in elderly people.<sup>80</sup> Similarly, numerous studies have demonstrated that geriatric depression symptoms decrease significantly with increased support from spouses, children, or other potential family members.<sup>46,81,82</sup> Finally, a significant negative association was also observed between geriatric depression and quality of life enjoyment and satisfaction. That is, a lack of enjoyment and satisfaction in one's life leads to geriatric depression in the elderly. Consistently, geriatric depression and low quality of life enjoyment were recently observed in a sample of elderly people.<sup>83</sup> Other scholars found that a lower level of quality-of-life enjoyment among elderly people was significantly associated with a higher level of geriatric depression symptoms.<sup>83-86</sup>

## Strength and Study Implications

The primary strength of the study is that it was conducted in a country where there are few studies, especially on the psychosocial well-being of the elderly. In addition, the study showed a high prevalence of symptoms of geriatric depression in the study sample, with females more vulnerable than males. This study revealed that lower levels of family support and quality of life enjoyment and satisfaction were associated with increased symptoms of geriatric depression. The results imply that family support and quality of life should be improved to prevent geriatric depression in the elderly by focusing specifically on women. Another implication of the findings is that, in close collaboration with policymakers and decision-makers, family members should be encouraged and supported to plan and implement family-based interventions targeting improving the well-being of elderly people in their respective families. The reason for this is that observed geriatric depression can be mitigated or caused by quality of life and family support.

## Limitations

The first limitation is that our study explored family determinants. The contribution of community factors and co-morbidity should also be investigated in this sample for advanced support. The second limitation is methodological because a cross-sectional study design was adopted. With this design, data concerning the rate, comprehension of differences in demographic

traits, and family determinants were highlighted, but the direct cause-effect relationship was not assessed. Therefore, a similar study with a longitudinal study design is needed to test the cause-and-effect relationship. The third limitation, the self-Rating Depression Scale (SDS) is commonly used for adult people and not exclusively for geriatric. Finally, family determinants such as intimate partner violence and perceived poverty that might be plausible determinants should also be assessed.

## Conclusion

Geriatric depression was relatively common in our participants. It can be mitigated or generated by the quality of life and family support received. Hence, adequate family-based interventions are needed to improve the well-being of geriatric people in their respective families.

## Data Sharing Statement

Based on a reasonable request, the corresponding author can provide the data that supports the study's conclusions.

## Ethics and Consent

The ethical consent was approved by the Institutional Review Board of the University of Rwanda, CMHS (IRB-CMHS). We confirm that participants provided written informed consent for their voluntary participation. The principles set forth in the Helsinki Declaration were also observed.

## Disclosure

The authors report no conflicts of interest in this work.

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